Thrombus Formation on a Left Atrial Appendage Closure Device

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For patients with contraindications to chronic oral anticoagulation, new therapeutic approaches have been developed.[1]

Transcatheter closure of the left atrial appendage (LAA) is becoming more common as an interventional therapy to prevent thromboembolic complications in patients with atrial fibrillation (AF) and contraindications to chronic oral anticoagulation. Most of the studies about this new technique demonstrated its safety as an alternative method to oral anticoagulation in this group of patients.[1] One of the feared complications is thrombus formation in relation with the device. To prevent this, patients are medicated with long-term antiplatelet treatment.[1] A case is reported in which a thrombus was noted on the left side of an Amplatzer Cardiac Plug by transesophageal echocardiography, and anticoagulation had to be started.

Case Report

A 75-year-old man with chronic AF, previous ischemic stroke, known ischemic cardiomyopathy (with previous coronary bypass grafting surgery after myocardial infarction), medicated hypertension, diabetes mellitus, and a CHADS2 score of 6 had to stop oral anticoagulation because of persistent hematuria.In March 2010, a percutaneous closure of the LAA with a 28-mm Amplatzer Cardiac Plug device was performed. The procedure to implant the device was free of complications and had no residual flow at the end. The patient was on a daily dose of aspirin 100 mg, and 100 U/kg heparin was added at the beginning of the procedure. He was asymptomatic under double-antiaggregation therapy with aspirin and clopidogrel. The 6-month follow-up transesophageal echocardiography revealed autocontrast in the left atrium and a sessile thrombus (18×9 mm) located at the left atrial side of the device (Figure). There was particular concern about embolization, and intravenous heparin was started (maintaining the activated partial thromboplastin time ratio at >2.5). A further transesophageal echocardiography performed 1 week after heparin was started showed no resolution of the thrombus, which maintained the same dimensions. Transesophageal echocardiography was repeated 3 weeks later and showed reduction of the thrombus. The patient was started on oral anticoagulation and continued to be stable without any cardiovascular events. There were no early complications as a result of the treatment. Unfortunately, he later developed hematuria (with the need for transfusion support), and anticoagulation had to be stopped again. He remained assyntomatic.

Discussion

AF is epidemiologically the most common cardiac arrhythmia, and it is responsible for 15% to 20% of all ischemic strokes.[2] Although the potential of warfarin to reduce systemic embolization in AF is well established, its use is difficult, especially in older patients, because of significant drug interactions, the need of frequent monitoring of the international normalized ratio, a very narrow therapeutic range, and a high risk of bleeding complications. In patients treated with oral anticoagulation, approximately 44% of patients have suboptimal therapeutic levels.[3] Therefore, alternative treatments to prevent stroke in patients with AF are needed. It is assumed that >90% of clinically apparent embolisms in AF originate from the LAA. Obliteration of the LAA might provide an alternative therapy for stroke prevention in patients with AF at high risk of systemic embolization.

Three devices have been specifically designed for LAA occlusion: the Percutaneous Left Atrial Appendage Transcatheter Occlusion (PLAATO), the WATCHMAN LAA system, and the Amplatzer Cardiac Plug. Devices differ in design, and their implantation is made by venous access and transseptal puncture, under local anesthesia. The PLAATO device has been discontinued for commercial reasons.

Several studies of the percutaneous transcatheter delivery of dedicated LAA occlusion devices have shown promising results that offer an alternative to warfarin therapy for selected patients (those with chronic AF and contraindication to warfarin therapy).[1]

In the PLAATO trial,[4] a nonrandomized, prospective study, LAA occlusion was successful in all patients, and there were no complications or embolic events at 1-month follow-up. The study demonstrated the safety and effectiveness of the PLAATO implantation.

Likewise, the recently published Protection in patients with Atrial Fibrillation (PROTECT-AF) trial,[5] comparing closure of the LAA with the WATCHMAN device with long-term warfarin therapy, showed that there was a reduction in

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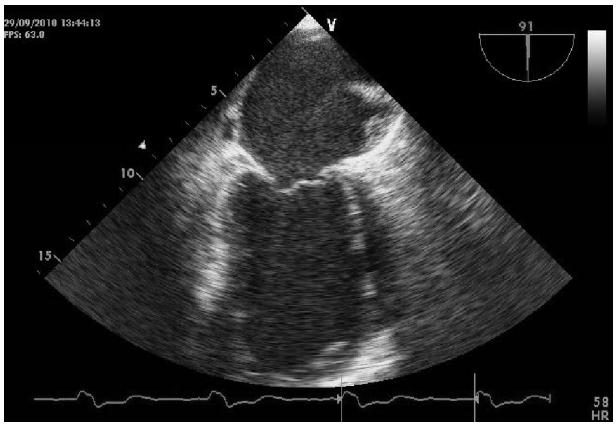

Figure. Mid esophageal 2 (chamber view, 90 degrees). Thrombus located at the left atrial side of the Amplatzer.

hemorrhagic stroke risk versus warfarin, and all-cause stroke and all-cause mortality outcomes were not inferior to warfarin. The primary end point was the absence of ischemic and hemorrhagic stroke, cardiovascular and unexplained death, and systemic embolism. However, implantation of the WATCHMAN device causes a significant procedural risk that must be taken into account, including pericardial effusion requiring invasive treatment and acute ischemic stroke due to thromboembolism. There are also some reports of complications related to the transseptal puncture or device, such as postimplantation sepsis and device embolization.[5] However, we might think that, as in the occlusion of atrial septal defects, thrombosis may occur in the implantation process because of inadequate size, incorrect placement, or instability of the device, but in these reported complications of the technique, thrombosis is acute.[6]

There is no direct comparison between the available devices. In the literature, most of the studies showed relative risk reduction of stroke compared with the predicted rate with the SCHADS2 score.[1]

The current antithrombotic regimen recommendation differ between WATCHMEN and Aplatzer cardiac plug device. In the later, current recommendations after the LAA closure, patients be medicated with aspirin (81–325 mg) indefinitely and with clopidogrel (75 mg) for at least 4 to 6 weeks. The ACTIVE study[8] showed the superiority of double-antiplatelet therapy versus aspirin alone, so these patients should maintain double-antiplatelet therapy.

Despite the encouraging results of several studies about percutaneous LAA exclusion, we are in the learning curve, and additional studies are needed to verify the safety and effectiveness of the devices, and to know if the current practice of treating patients only with double-antiplatelet therapy before endothelization of the device is sufficient, or if one should use oral anticoagulation in the first 3 months as is advised in biological prostheses. As in the present case, thrombosis might be a rare, but possible complication, and information to guide treatment is lacking at present time.

Disclosures

None.

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